2015 PILOT TESTS

LIST OF TOOLS AND MATERIALS

ADVERTISING AND DESIGN – PILOT (4119)

NOTE: The digital wildlife conservation images and paw print image should be **ready** and **available** for evaluators upon their arrival at test site. Instructors should ensure the graphics are available at all workstations.

Participants should not be penalized for incorrectly calibrated equipment.

JOB 1: DESIGN: COMPUTER COMPREHENSIVE - PREPARE AND PRINT FILES

- Digital image of Baboons (appropriate for a wildlife conservation flyer)
- "Paw print" digital image (this graphic is available as a custom shape in PhotoShop)
- One flash drive for the evaluator, or other means of storage (e.g., flash drive, SD card, external storage device) – Used for Jobs 1 and 2
- Computer with page layout and image editing software (e.g., Illustrator, InDesign, Corel Draw)
- Color printer with 11 by 17 printing capability, calibrated to CMYK color
- 11-inch by 17-inch white printer paper
- Font types: Times New Roman and Arial

JOB 2: LAYOUT: REDESIGN

- 2nd Digital image (different from Job 1), theme appropriate for a wildlife conservation flyer
- Computer and image editing software (e.g., Illustrator, InDesign, Corel Draw)
- Color printer with 11 by 17 printing capability, calibrated to CMYK color
- 11-inch by 17-inch white printer paper
- Font types: Times New Roman and Arial

AGRICULTURE MECHANICS – PILOT (2202)

Job 1: Horizontal Butt Weld – SMAW

- All necessary protective clothing and safety equipment
- Two pieces of mild steel plate (per participant), 3/8-inch by 2-inch by 6-inch
- AC-DC or AC welding machine
- Welder's helmet
- Chipping hammer
- Wire brush
- Four (4) E6011 electrodes, 1/8 inch diameter

Job 2: Oxyacetylene Cutting

- All necessary protective clothing and safety equipment
- One piece of mild steel plate (per participant) 1/4-inch by 5-inch square
- Provide an oxyacetylene cutting rig with the proper tip for this job
- Soapstone
- Steel ruler (12 inch)

Job 3: Troubleshoot and Diagnose a Gas Engine

- All necessary protective clothing and safety equipment
- One small gas engine with low or incorrect compression, with fuel removed
- Operator's manual for engine being used
- Compression test kit
- Spark plug wrench
- Assorted tools, including some that would be incorrect for use with Job 3
- Spark plug gapper or feeler gauge
- Spark tester
- Pencil

Job 4: Install Two 3-Way Switches to Control a Light

- All necessary protective clothing and safety equipment
- Wiring board (as shown in Job 4 diagram)
- Two 3-way switches
- Screwdriver (Phillips #2 and flat)
- 14 gauge, 3-wire NM electrical cable
- 14-gauge, 2-wire NM electrical cable
- Lighting outlet without built-in receptacle
- Light bulb for testing
- Wire nuts
- Grounding clamps
- Electrical pliers
- Needlenose pliers
- Wire stripper

Job 5: Cut, Mark, and Drill Lumber

- All necessary protective clothing and safety equipment
- Various lengths of 1- by 4-inch boards that are at least 3 feet long
- Framing square or speed square
- Pencils
- Portable electric drill and drill bit (1/4-inch)
- Portable electric circular saw (hand saw is acceptable)
- Tape measure

AUTOMOTIVE TECHNICIAN-CORE – PILOT (4309)

JOB 1: BRAKES: Disc Brake Assembly Service

- Vehicle with front disc brake assembly (or equivalent trainer)
- Hubless brake rotors for machining (1 per participant)
- Dual indicator and mount
- Socket set, 3/8-inch drive
- Torque wrench and sockets
- Rotor specifications
- Rotor micrometer
- Brake lathe (on-car and/or off-car)

JOB 2: ELECTRICAL/ELECTRONIC SYSTEMS: Test and Diagnose Battery, Starting, and Charging System

- Test vehicle with correctly functioning battery, starting, and charging system
- Multiple charged batteries available
- Appropriate tester to perform a load test
- Tachometer or scanner to read RPMs, as available
- Hard copy of test vehicle specifications and three distracter vehicle specifications (e.g., binder or clipboard)
- Digital Volt Ohm Meter (DVOM)

JOB 3: ENGINE PERFORMANCE: Test Electronic Engine Control Component

- Vehicle equipped with electronic fuel injection system
- Vehicle must have two “bugged” sensor circuits
- Manufacturer’s service information
- “Bugged” sensor circuits must match fault codes set in the Pulse-code modulation (PCM)
- Scan tool

JOB 4: SUSPENSION AND STEERING: Tire Service and Balance

- Two wheels (whatever size is available)
- Two tires to match rim size
- Tire changing machine
- Tire pressure gauge
- Tire bead lubrication with applicator
- Valve core removal tool
- Electronic tire balance machine
- Assorted clip-on wheel weights
- Wheel weight hammer and pliers
- Extra valve stems and cores (as needed)

Suggestions for Test Administration

1. Evaluators should read through the entire performance test carefully before the day of administration.

2. Remind participants to read instructions and to follow them carefully. Participants may complete any or all jobs in pencil.

3. Participants should fully understand what is expected of them before beginning the test. You may wish to go over the directions orally before testing begins.

4. **Remind participants not to work ahead in the booklet**. Whenever a job is completed early, the extra time should be used for checking work.

5. Provide time reminders to discourage clock-watching.

AUTOMOTIVE TECHNICIAN-ADVANCED – PILOT (4308)

JOB 1: BRAKES: Disc Brake Assembly Service

- Vehicle with front disc brake assembly (or equivalent trainer)
- Hubless brake rotors for machining (1 per participant)
- Dial indicator and mount
- Socket set, 3/8-inch drive
- Torque wrench and sockets
- Rotor specifications
- Rotor micrometer
- Brake lathe (on-car and/or off-car)

JOB 2: ELECTRICAL/ELECTRONIC SYSTEMS: Test and Diagnose Battery, Starting, and Charging System

- Test vehicle with correctly functioning battery, starting, and charging system
- Multiple charged batteries available
- Appropriate tester to perform a load test
- Tachometer or scanner to read RPMs, as available
- Hard copy of test vehicle specifications and three distracter vehicle specifications (e.g., binder or clipboard)
- DVOM

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- Two tires to match rim size
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- Tire pressure gauge
- Tire bead lubrication with applicator
- Valve core removal tool
- Electronic tire balance machine
- Assorted clip-on wheel weights
- Wheel weight hammer and pliers
- Extra valve stems and cores (as needed)

AUTOMOTIVE TECHNICIAN-ADVANCED – PILOT (4308) (continued)

JOB 5: AUTOMATIC TRANSMISSION/TRANSAXLE: Perform transmission/transaxle pressure test

- Vehicle with an automatic transmission
- Automatic transmission test gauge set with hoses
- Scan tool (if necessary) or tachometer

Gauges must be hooked up prior to test administration

JOB 6: ENGINE REPAIR: Cylinder Head Service

- Identified cylinder head with an exhaust valve removed and retained
- Hard copy of appropriate specifications (e.g., binder or clipboard)
- Straightedge
- Feeler gauge set (metric and English marked)
- Micrometers (0 to 1 inch and 0 to 25 mm)

JOB 7: HEATING AND AIR CONDITIONING: Diagnose an Automotive Air Conditioning System

- Operational automotive air conditioning system or equivalent trainer
- Gauge set
- Hard copy of appropriate specifications (e.g., binder or clipboard)
- Safety goggles

JOB 8: MANUAL DRIVE TRAIN AND AXLES: Service and Adjust Final Drive Assembly

- Hypoid differential
- Dial indicator with magnetic base
- Service information

Suggestions for Test Administration

1. Evaluators should read through the entire performance test carefully before the day of administration.
2. Remind participants to read instructions and to follow them carefully. Participants may complete any or all jobs in pencil.
3. Participants should fully understand what is expected of them before beginning the test. You may wish to go over the directions orally before testing begins.
4. **Remind participants not to work ahead in the booklet**. Whenever a job is completed early, the extra time should be used for checking work.
5. Provide time reminders to discourage clock-watching.

BUILDING CONSTRUCTION OCCUPATIONS – PILOT (4011)

JOB 1: SOLDER PIPE

1/2-inch copper tubing, 18 inches minimum
One 1/2-inch 90-degree elbow (copper)
1/2 inch cap
1/2 inch male adapter (hose bibb for leak test)
Sink or other pressurized water supply
Water hose
Lead-free solder
Flux
Flux brush
Tubing cutter/reamer
CHANNELLOCK® or other grooved-joint pliers
Plumber's torch with igniter
Tape or rule
Steel wool/emery cloth/wire brush, 1/2-inch fitting
Joint compound or Teflon® tape
Shop rags
Appropriate personal protective equipment (PPE)
ABC fire extinguisher
Pencil or marker

JOB 2: LAYOUT RAFTER

Other materials may be substituted for dimensional lumber for Job 2.

One – 2-inch by 6-inch by 8-foot dimensional lumber
Sawhorses
Stair gauges
Framing square, as needed
Circular saw
Extension cord, as needed
Hand saw
Clamp
Speed square
Tape measure, 12-foot minimum
Appropriate personal protective equipment (PPE)
Pencils

JOB 3: CALCULATE AND CUT A STUD

One – 2-inch by 4-inch by 4-foot dimensional lumber
Sawhorses
Framing square, as needed
Circular saw
Extension cord, as needed
Clamps
Speed square
Tape measure, 12-foot minimum
Appropriate personal protective equipment (PPE)
Pencils

JOB 4: ROUGH AND FINISH ELECTRICAL

A studded or framed workstation must be provided by the instructor and constructed PRIOR to test administration. This workstation is intended to allow participants to mount boxes and switches, staple, run wire, and connect switches and outlets. The workstation is **NOT** an evaluated item and can be constructed from available materials (including used) and can be of varying size (part of a larger framed structure, freestanding, or small in size and table-mounted with vices or clamps).

One - Single-pole switch
Three - Non-metallic device boxes
Two - Duplex receptacles
One - Three-way switch
6 feet - 14/2 cable
6 feet - 14/3 cable
Ten - Yellow wire nuts
Ten - Red wire nuts
Electrical tape
Ten - Cable staples
Lineman pliers
Long-nosed pliers
Hammer
Flathead screwdriver
Phillips screwdriver
Diagonal cutter
Measuring tape
ROMEX® strippers and/or retractable utility knife
Wire strippers
Appropriate personal protective equipment (PPE)
Pencils

JOB 5: 8-INCH BLOCK WALL CONSTRUCTION

Four - Corner (jamb) blocks
Two - Half corner (jamb) blocks
Four - Line (stretcher) blocks
Levels, 2-foot and 4-foot
Trowel
Convex jointer
Prepared mortar
Mortar board and stand
Mason's brush
Measuring tape or modular rule
Brick hammer
Water (as needed)
Appropriate personal protective equipment (PPE)
Pencils

COMMERICAL FOODS – PILOT (4120)

JOB 1: IDENTIFICATION OF HAND TOOLS, HERBS, SPICES, AND FLAVORINGS

Place 25 labels or tags with numbers 1 through 25 (only) on the following items

Display the following items

1. zester
2. channel knife
3. melon baller
4. mandoline
5. whetstone
6. offset spatula
7. clam knife
8. china cap
9. skimmer
10. fillet knife
11. bench scraper
12. food mill
13. basil
14. cilantro
15. rosemary*
16. thyme*
17. sage
18. coriander
19. nutmeg (whole or ground)
20. cayenne pepper
21. salt*
22. curry
23. peppercorns
24. soy sauce *
25. sesame seeds

Fresh seasonings marked with an asterisk (*) may be reserved to use again in Job 3 – Cooking Skills
NOTE: Herbs, spices, and flavorings may be fresh, dried, or ground.

Appropriate substitutions *of comparable difficulty* may be made if necessary, but the number of items on display should not change.

If tools or food items are not available, you may use clear visual images of these items (e.g., photographs).

COMMERICAL FOODS – PILOT (4120) (continued)

JOB 2: KNIFE SKILLS

- Assorted pre-sharpened knives for cutting vegetables
- Sharpening steel
- Cutting board with mat or towel
- Towels
- Sanitation buckets and solution

The following will be prepared in Job 2, and then reserved for Job 3:

- Onion, 1
- Garlic cloves, 3
- Celery, 1 rib
- Parsley, 1/4 bunch
- Carrot, 1 large
- Red bell pepper, 1
- Green bell pepper, 1/2
- Fresh ginger, 1 small
- Scallion, 1
- Fresh herbs, assorted mixed, 2 ounces
- Cucumber, 1/4

COMMERICAL FOODS – PILOT (4120) (continued)

JOB 3: COOKING SKILLS (per participant)

NOTE: Ovens are to be preheated to 375 degrees Fahrenheit by the evaluators prior to beginning Job 3.

- Two chicken breasts, split (6 to 8 ounces each, with bones and skin)
- Chicken stock, 2 to 3 cups
- Rice – 1/2 cup long, white
- Flour, all purpose, 8 ounces
- Granulated sugar, 1/4 tsp
- Vegetable oil, 8 ounces
- Peanut or sesame oil, 3 tbsp
- Butter, 8 ounces
- 1/2 cup buttermilk (1/2 cup milk + 1 tsp white vinegar, can be substituted)
- Heavy cream – 1/4 cup
- Cheddar cheese, shredded, 1/4 cup
- Lemon juice, 2 teaspoons
- Sweet and sour sauce, 3 tablespoons
- Soy sauce, 1 tablespoon
- Cider vinegar, 1 ounce
- Dijon mustard, 1 teaspoon
- Salt
- Pepper (black and white)
- Sea salt
- Onion powder
- Garlic powder
- Garlic, fresh
- Rosemary, fresh
- Thyme, fresh
- Sesame seeds
- Fresh herbs, assorted mixed, 2 ounces
- Parsley, fresh, 1/4 bunch
- Salad greens, mixed, 4 ounces (prewashed)
- Red bell pepper, 1
- Green bell pepper, 1/2
- Celery, 1 rib
- Onion, 1
- Granulated garlic 1/4 tsp
- Baking powder – 2 tsp
- Carrot, 1 large
- Snow peas, 2 ounces
- Cucumber, 1/4
- Ginger
- Scallions

COMMERICAL FOODS – PILOT (4120) (continued)

ADDITIONAL EQUIPMENT NEEDED

- Scale
- Range top
- Food storage containers (10)
- Assortment of knives (e.g., 1 chef, 1 paring)
- Assorted sauté pans
- Baking sheet pan
- Assorted pots and pans (e.g., 1 to 2 qt. sauce pan with lid)
- Appropriate pan/pot covers
- Service plates (2 each course: 2 salad plates, 4 dinner plates, etc.)
- Colander
- Vegetable peeler
- Spatulas
- Cutting board with mat
- Oven
- Oven mitts
- Disposable gloves
- Wire whisk
- Knife steel
- Small stainless steel bowl
- Tongs
- Measuring cups
- Measuring spoons
- Mixing spoon
- Pastry cutter
- Peppermill
- Towels
- 3-compartment sink
- Tasting spoons
- Sanitizing buckets
- Sanitizing solution
- Rolling pin
- Round biscuit cutter
- Pocket Thermometer
- Pencils
- Kitchen timer

COMPUTER NETWORKING FUNDAMENTALS – PILOT (4514)

NOTE: All equipment below for this performance assessment must be tested and in proper working condition (unless otherwise stated) prior to the testing date.

JOB 1: SET UP A SIMPLE LAN WITH TWO WORKSTATIONS AND HARDWARE INSTALLATION

Each participant will require TWO workstations for this job.

- **For each job, start with a fresh install of a Windows Operating System.**
- **Workstation #1 must have a NIC installed and the NIC driver properly configured.**
- **Workstation #2 must have a NIC installed that is not functioning.**
- **A copy of the NIC driver needs to be available in case the participant needs to reinstall the driver.**

For each participant:

- Two Windows-based PC workstations, labeled Workstation #1 and Workstation #2, with field-replaceable unit (FRU) NICs
- The NIC in Workstation #1 is correctly configured
- The NIC in Workstation #2 needs to be non-functioning
- Copies of the proper NIC drivers
- Two (correctly terminated) Cat-5 or newer straight-through cables
- An Ethernet hub or switch (at minimum: a 4- or 8-port) with appropriate AC adaptor
- NIC Adapter (PCI or PCI-E)
- Workstations booted, ready, and logged on with administrative access
- Writing utensils
- Paper

JOB 2: WIRELESS CONFIGURATION

NOTE: The router must be on its own LAN and not associated with the organization's network.

- Multipurpose device (e.g., wireless router) with the ability to offer DHCP services and wireless connections with a minimum of WEP
- Documentation for device with default password and IP address
- PC to connect for configuration
- Patch cable (to connect the PC and multipurpose device)
- Paper

COMPUTER PROGRAMMING – PILOT (4123)

NOTE: Unless otherwise stated, jobs are NOT program or language specific.

JOB 1: DESIGN SOLUTION LOGIC

- Computer with appropriate design solution logic software, (i.e., Visio), along with printer and paper **- OR -** template, paper, and pencils
- Scrap paper
- Pencils

JOB 2: WRITE A PROGRAM

- Computer with graphical development environment installed
- Printer with paper
- Removable digital storage media (as available at facility)
- Non-programmable calculator (or spreadsheet software)
- Scrap paper
- Appropriate language reference manuals
- Pencils

Note: Participants may provide their own templates, rulers, and technical manuals if preferred.

COMPUTER REPAIR TECHNOLOGY – PILOT (4515)

All appropriate safety precautions are to be followed throughout this test. Unsafe procedures will result in immediate test termination.

JOB 1: DEVICE IDENTIFICATION

Use a combination of computers to represent all of the following features:

- Sticker labels (20) for identifying the following features:

A. Audio port
B. Auxiliary power connector
C. CMOS battery
D. CPU
E. CPU cooling device
F. DVD-ROM drive
G. DVI
H. Ethernet connector (RJ45)
I. Memory slot #1
J. Molex connector
K. Motherboard/system board
L. Motherboard/system board power plug/P1
M. PCI or PCI express slot
N. PSU
O. PS/2 port
P. RAM
Q. USB port
R. Voltage switch
S. Video card/onboard video
T. ZIF socket

NOTE: Both Job 2 and Job 3 requires the removal of the NIC. The evaluator or testing center must provide two computers for each student or otherwise accommodate for NIC removal between job sessions.

JOB 2: INSTALLING NEW HARDWARE/TROUBLESHOOTING

Provide the following:

- NIC from an alternate manufacturer (different from NIC removed from computer)
- Media (i.e., flash drive, CD) containing several drivers (only one correct)
- Pencil and scrap paper

Participant computer minimum specifications (see NOTE above):

- Functional Windows® OS with no conflicts in Device Manager (Windows® XP, Vista®, Windows® 7, or Windows® 2000)
- Computer must have a working sound, video, and NIC
- Pentium 4 (or newer)
- 1 GB memory (or more)
- 10 GB free space (or more) on the boot drive

JOB 3: NETWORK CONNECTIVITY

- Laptop or desktop for EVALUATOR USE, with a saved file titled "**NOCTI FILE**"
- Crossover cables, if desired (may be used instead of a hub)
- Network device that will provide DHCP functionality
- Switch or hub with enough available ports for each participant
- Tested and functional CAT-5 (or newer) network cable for each participant
- PCI network card with media-appropriate drivers for the PC
- Standard PC technician's tool kit for each participant

Participant computer minimum specifications (see NOTE above):

- Functional Windows® OS (Windows® XP, Vista®, Windows® 7, or Windows® 2000)
- Pentium 4 (or newer)
- 128 MB memory (or more)
- 10 GB free space (or more) on the boot drive
- PCI slot available for a PCI network card

EARLY CHILDHOOD EDUCATION AND CARE-ADVANCED – PILOT (4117)

Instruct participants that they will be evaluated on professional, appropriate appearance

- Quiet workspace with desk/table and chair
- Dictionary
- Animal resource books or computer
- Thesaurus
- Paper
- Chart paper (optional)
- Pens and pencils
- Photocopier (access to)
- Preschool classroom or simulation
- Group of three to five preschool children, ages 3 to 5
- Room to accommodate Small Group Lesson plan implementation
- Markers
- Colored pencils
- Crayons
- Assorted art materials (colored construction paper, flannel board pieces, plain white paper, stickers, etc. – as available)
- Glue
- Scissors
- Tape

NOTE: A group of **three to five** children (3 to 5 years old) will be needed for Job 2. The evaluator should determine and arrange for a number of children so that no group of children will be asked to sit through more than two consecutive combined sessions of Job 2.

EARLY CHILDHOOD EDUCATION AND CARE-BASIC – PILOT (4116)

JOB 1: PREPARE A LESSON PLAN

- Writing instruments (pens, pencils)
- Early childhood resource books such as: activity/theme books, journals, teacher's magazine, etc.
- Access to the Internet for preschool-oriented planning websites, if possible
- Scrap writing paper
- Assorted color construction paper
- Paper (i.e., tissue, tracing, poster board)
- Scissors
- Glue or glue stick
- Crayons, markers
- Rulers
- Clear and masking tape
- Rubber bands
- Paper fasteners (i.e., stapler, paper clips, brass fastener)
- Access to copy machine for Evaluator

Job 1 - Extra supplies that may be provided:

- Aluminum foil
- Buttons
- Chalk
- Clay
- Cups (paper)
- Egg cartons
- Flannel, felt, or fabric
- Index cards
- Jars (various sizes)
- Magazines
- Magnet
- Paint
- Paper bags (lunch size)
- Pasta
- Pipe cleaners
- Plastic containers
- Popcorn
- Popsicle sticks
- Poster board or oak tag
- Q-tips
- Salt
- Sponges
- Spools
- Straws
- Styrofoam trays
- Toothbrushes
- Velcro
- Wallpaper
- Yarn or string

NOTE: **Jobs 2, 3, and 4 require presenting activities to a group of children. The evaluator should determine and arrange for a number of children so that no group of children will be asked to sit through more than *two* consecutive combined sessions of Jobs 2, 3, and 4.**

JOB 2: STORYTELLING

- Provide a small (3 to 5) group of preschool children as the audience.
- Provide a selection of 5 children's books:
  3 books that are preschool age-appropriate, short, and easy to read
  2 books that are clearly **not** age-appropriate for preschooler level

JOB 3: GROSS MOTOR MOVEMENT ACTIVITY

- Provide a small (3 to 5) group of preschool children as the audience.

JOB 4: LESSON PRESENTATION

- Provide a small (3 to 5) group of preschool children as the audience.

JOB 5: ROOM ARRANGEMENT

- Writing instruments (pencil, blue or black pen)
- Glue or glue stick
- Scissors
- Ruler

ELECTRONICS TECHNOLOGY – PILOT (4135)

Components for all four jobs should be placed together in one location. Participants are to select appropriate components for use with each job.

SAFETY GLASSES MUST BE WORN THROUGH OUT ALL PERFORMANCE JOBS

JOB 1: SOLDERING AND DE-SOLDERING

- De-soldering wick
- Solder sucker
- Rosin-core solder
- Soldering iron, 25 watt, with holder
- Printed circuit board(s), dual-sided (through-hole), with components intact
- Two (2) resistors
- Two (2) capacitors (one (1) polarized and one (1) non-polarized)
- One (1) transistor (or similar TO-92 case component)
- Diagonal cutters
- Vise (circuit board vise or other acceptable clamping device)
- Heat sink (alligator clip)
- Needlenose pliers
- Pencils and scrap paper

JOB 2: POWER SUPPLY CONSTRUCTION AND CIRCUIT ANALYSIS

- Four (4) diodes IN4001 or equal
- Two (2) 1kΩ 1/4-watt resistors
- Five (5) various value 1/4 watt resistors to be used as decoys
- 120V to 12.6V AC center tapped transformer or 12V AC center tapped voltage source
- Hook-up wire
- Multimeter with leads
- Dual trace scope with leads and ground
- Wire strippers
- Diagonal cutters
- Needlenose pliers
- Protoboard or breadboard
- Two (2) 100µF filter capacitors
- Pencils and scrap paper
- Scrap paper

ELECTRONICS TECHNOLOGY – PILOT (4135) (continued)

JOB 3: OPERATIONAL AMPLIFIER CONSTRUCTION AND ANALYSIS

- One (1) 741 operational amplifier
- One (1) 10 kΩ 1/4–watt resistor
- One (1) 2kΩ 1/4–watt resistor
- Two (2) 9V batteries with connectors –OR- One (1) dual DC power supply
- Oscilloscope (dual trace) with probes and ground
- Multimeter with leads
- Protoboard or experimenter
- Hook-up wire
- Needlenose pliers
- Wire strippers
- Diagonal cutters
- Pencils and scrap paper

JOB 4: DESIGN AND BUILD A COMBINATIONAL LOGIC CIRCUIT

- Pencils and scrap paper

Integrated Circuit Parts List:

- Two (2) 74LS04 Hex Inverter ICs
- Three (3) 74LS08 Quad, 2 Input, AND ICs
- One (1) 74LS32 Quad, 2 Input, OR ICs
- One (1) 74LS00 Quad, 2 Input, NAND ICs

Miscellaneous:

- 2 feet – hook-up wire (20 gauge)
- Wire cutters/strippers
- Breadboard
- Logic probe (optional)
- +5- volt DC power supply
- Logic trainer with logic monitor with 3 logic switches

NOTE: If a logic trainer is not available, 3 SPDT, 1 LED, and a 150Ω resistor can be used.

FASHION TECHNOLOGY AND MERCHANDISING – PILOT (4018)

GENERAL TOOLS/MATERIALS FOR THIS TEST:
Each participant must have access to:

Sewing machine in good working condition

Overlock/serger

Iron and ironing board

Adequate work space

Work table appropriate for layout and cutting

All fabric should be in cut-ready condition (not crumpled/wrinkled)

JOB 1: PATTERNMAKING

- Bodice sloper pattern
- Ruler
- French curve or regular curve (for pattern drafting)
- Paper shears
- Push pins
- Sharpened pencil with eraser
- Envelope large enough for pattern pieces
- Paper
- Tape

JOB 2: SEAM SAMPLES

- 8 pieces of **pre-cut** fabric (4 inches by 8 inches)
- Sewing machine needles
- Thread
- Pins
- Shears
- Seam gauge

JOB 3: CREATE A MOOD BOARD

- Inspiration/mood board (8 1/2 by 11 inches)
- Pencils, pens, and other needed writing instruments
- Abundant fabric samples (2 inches by 2 inches)
- Croquis
- Colored pencils
- Markers
- Double-stick tape
- Stapler with staples
- Glue sticks
- Ruler
- Shears
- Paper shears
- Pinking shears
- Magazines, newspapers, and/or other forms of inspiration

JOB 4: LAYOUT, CUT, AND CONSTRUCT A SKIRT BACK

- **Pre-Cut and Pre-Marked Fabric** – 45 inches wide, 1/3 to 2/3 yard
- Pattern pieces (Misses Size 6) – basic skirt with **two darts, back zipper, and waistline facing** (provided by site)
- Fusible interfacing
- Zipper, nylon (7 inch)
- Zipper foot for sewing machine
- Sewing machine needles
- Thread
- Pins
- Shears
- Ruler/tape measure
- Marking pen or chalk
- Tracing paper and tracing wheel
- Seam ripper
- Seam gauge

FLORICULTURE – PILOT (4349)

JOB 1: PLANT CLASSIFICATION AND IDENTIFICATION

- 50 plants **or photos of plants**, selected from list on the following pages:
  - 10 annuals
  - 20 cut flowers
  - 15 house plants
  - 5 cut foliage
- Writing utensil (pen or pencil)
- List of plants (in participant's performance book)

List of Plants for Job 1 – by Type

Annuals (choose 10)

Number	Name
2	Ageratum mexicanum cv./Ageratum
12	Begonia x semperflorens-cultorum/Wax Begonia
13	Begonia x tuberhybrida cv./Tuberous Begonia
19	Celosia cristata cv./Cockscomb
27	Cleome speciosa/Spider Flower
29	Coleus x hybridus/Coleus
66	Impatiens hybrid cv./Impatiens
76	Lobelia erinus/Annual Lobelia
77	Lobularia maritima/Sweet Alyssum
87	Nicotiana alata /Flowering Tobacco
90	Pelargonium peltatum cv./Ivy Geranium
91	Pelargonium x domesticum cv./Regal Geranium (Lady Washinington)
92	Pelargonium x hortorum cv./(Zonal) Geranium
96	Petunia x hybrida cv./Common Garden Petunia
114	Salvia splendens cv./Salvia
120	Senecio cineraria 'Diamond'/Diamond Dusty Miller
131	Tagetes species cv./Marigold
134	Viola x wittrockiana cv./(Garden) Pansy
138	Zinnia elegans/Zinnia

List of Plants for Job 1 – by Type (continued)

Cut Flowers (choose 20)

Number	*Name*
1	Achillea millefolium/Yarrow
3	Alstromeria aurantiaca/Peruvian Lily
4	Anthirrhinum majus cv./Snapdragon
5	Anthurium x andraeanum cv./Anthurium, Flamingo Lily
16	Carthamus tinctorius/Safflower
21	Chamelaucium uncinatum/Wax Flower
25	Chrysanthemum x morifolium/Standard Daisy
30	Consolida/Larkspur
34	Delphinium elatum/Delphinium
35	Dianthus caryophyllus/Carnation (standard)
42	Erica sp./Heather
46	Eustoma grandiflorum (Lisianthus)
51	Freesia x hybrida/Freesia
54	Gerbera jamesonii/Gerbera Daisy
56	Gypsophilia elegans/Baby's Breath
58	Helianthus sp./Sunflower
68	Iris x xiphium/Dutch Iris
71	Liatris spicata
72	Lilium sp. Oriental/Hybrid Lily
73	Lilium asiatica/Asiatic Lily
75	Limonium sinuatum/Statice
80	Matthiola incana (Stock)
82	Moluccella laevis/Bells of Ireland
89	Paeonia cv./Peony
107	Rosa sp./Standard Rose
113	Salix sp.
124	Solidago sp.
127	Stephanotis floribunda/Stephanotis
133	Tulipa cv./Tulip
136	Zantedeschia sp./Calla Lily

FLORICULTURE – PILOT (4349) (continued)

List of Plants for Job 1 – by Type (continued)

House Plants (choose 15)

Number	Name
5	Anthurium x andraeanum cv./Anthurium, Flamingo Lily
6	Aphelandra squarrosa cv./Aphelandra, Zebra Plant
8	Araucaria heterophylla/Norfolk Island Pine
9	Asparagus densiflorous 'sprengeri'/Sprengri "Fern"
10	Asparagus setaceus/Asparagus "Fern"
15	Calceolaria crenatiflora cv./Pocketbook Plant
17	Cattleya cv./Cattleya Orchid Hybrid
20	Chamaedorea elegans/Parlor Palm
23	Chlorophytum commosum cv./Spider Plant
26	Cissus rhombifolia "mandaiana"/Grape Ivy
28	Codiaeum variegatum pictum cv./Croton
31	Crassula argentea/Jade Plant
32	Cyclamen x persicum cv./Florist's Cyclamen
33	Cymbidium cv./Cymbidium Orchid
36	Dieffenbachia maculata cv./Spotted Dumbcane
37	Dracaena fragrans 'Massangeana'/Corn Plant Draceana
38	Dracaena marginata/Red Edge Draceana
40	Echinocactus cv./Barrel Cactus
41	Epipremnum aureum cv./Golden Pothos, Devil's Ivy
44	Euphorbia milii splendens/Crown-of-Thorns
45	Euphorbia pulcherrima cv./Poinsettia
47	Exacum affine/German (Persian) Violet
50	Ficus benjamina 'Exotica'/Benjamin Fig
48	Ficus elastica 'Decora'/'Decora' Rubber Plant
49	Ficus pumila/Creeping Rubber Plant
52	Fittonia verschaffeltii/Nerve Plant
53	Gardenia jasminoides 'Fortuniana'/Gardenia
55	Gynura aurantiaca 'Sarmentosa'/"Purple Passion," Velvet Plant
60	Heptapleurum arboricola/Dwarf Schefflera, Dwarf Octopus Tree
61	Hippeastrum hybrid cv./Amaryllis
63	Hoya carnosa/Wax Plant
65	Hydrangea macrophylla/French (Florist's) Hydrangea
69	Justicia brandegeana/Shrimp Plant
70	Kalanchoe x blossfeldiana cv./Kalanchoe
79	Maranta leuconeura kerchoviana/Prayer Plant
84	Monstera deliciosa/Cutleaf "Philodendron"
85	Neoregelia carolinae 'Tricolor'/Bromeliad

List of Plants for Job 1 – by Type (continued)

House Plants (continued)

Number	Name
86	Nephrolepis exaltata cv./Boston Fern
88	Opuntia tribe cv./Cactus
93	Peperomia argyreia/Watermelon Peperomia
94	Peperomia caperata/Emerald Ripple Peperomia
95	Peperomia obtusifolia "Variegata'/Variegated Peperomia
97	Phalenopsis cv./Phalaenopsis (Butterfly) Orchid
98	Philodendron scandens oxycardium/Heartleaf Philodendron
99	Pilea cadierei/Aluminum Plant
100	Pilea involucrata/Friendship Plant
101	Pilea microphylla/Artillery Plant
102	Pilea nummulariifloia/Creeping Charley
104	Plectranthus mummularis/Swedish Ivy
106	Rhododendron cv./Azalea
111	Saintpaulia ionantha cv./African Violet
115	Sansevieria trifasciata cv./Snake Plant
116	Saxifraga stolonifera/Strawberry Plant
117	Schlumbergera bridgesii/Christmas Cactus
118	Schlumbergera truncata cv./Thanksgiving Cactus, Crab Cactus
121	Senecio x hybridus cv./Florist's Cineraria
122	Sinningia speciosa Fyfiana Group cv./Gloxinia
123	Solanum pseudocapsicum cv./Jerusalem Cherry
125	Spathiphyllum clevelandii/White Anthurium, Peace Lily
129	Sterlitzia reginae/Bird-of-Paradise
130	Syngonium podophyllum/Nephthytis
132	Tolmiea menziesii/Piggyback Plant
137	Zebrina pendula cv./Wandering Jew

List of Plants for Job 1 – by Type (continued)

Cut Foliage (choose 5)

Number	Name
14	Buxus sp.
18	Cedrus sp/Cedar
43	Eucalyptus polyanthemos/Silver Dollar Eucalyptus
57	Hedera helix cv./English Ivy
103	Pinus strobes
109	Ruhohra adiantiformis/Leather Leaf Fern, Baker Fern
110	Ruscus hypoglossum/Italian Ruscus
112	Salal sp.
135	Xerophyllum sp.

JOB 2: SYMMETRICAL TRIANGLE ARRANGEMENT

(per participant)

- 9 Standard Carnations
- 5 Daisy or Cushion Poms
- 2 stems Baby's Breath
- 10 stems Leather Leaf
- Container
- Floral Foam-dry (1/3 block)
- Floral shears or floral knife
- Florist knife
- Waterproof dish tape (anchor tape)
- Sink or bowl of water to soak the foam
- Calculator
- Writing utensil (pen or pencil)

JOB 3: DESIGN A MULTI-FLOWER CORSAGE

- Several types of flowers, various colors (may be artificial)
- Florist knife
- Florist shears
- Floral tape
- Corsage ribbon in assorted colors
- Wire—assorted sizes
- Wire cutters
- Floral adhesive (pan or floral glue)
- Plastic corsage bag/box
- Corsage pin
- Small amount of foliage, tulle, or artificial leaves
- Chenille stems/pipe cleaners (white or green

NOTE: Participants may use either floral wire/tape or floral adhesive to secure flowers in Job 3.

JOB 4: CASH REGISTER/SALES

- Cash register or cash drawer with calculator
- Order pad
- Writing utensil (pen or pencil)
- Paper currency and coins (may be real or “play” money)
- Product price list (in participant’s performance book)
- Individual to serve as customer (not a student)

FLORICULTURE-GREENHOUSE – PILOT (4350)

JOB 1: PLANT CLASSIFICATION AND IDENTIFICATION

- 50 plants **or photos of plants**, selected from list on the following pages:
  - 10 annuals
  - 20 cut flowers
  - 15 house plants
  - 5 cut foliage
- Writing utensil (pen or pencil)
- List of plants (in participant's performance book)

List of Plants for Job 1 – by Type

Annuals (choose 10)

Number	Name
2	Ageratum mexicanum cv./Ageratum
12	Begonia x semperflorens-cultorum/Wax Begonia
13	Begonia x tuberhybrida cv./Tuberous Begonia
19	Celosia cristata cv./Cockscomb
27	Cleome speciosa/Spider Flower
29	Coleus x hybridus/Coleus
66	Impatiens hybrid cv./Impatiens
76	Lobelia erinus/Annual Lobelia
77	Lobularia maritima/Sweet Alyssum
87	Nicotiana alata/Flowering Tobacco
90	Pelargonium peltatum cv./Ivy Geranium
91	Pelargonium x domesticum cv./Regal Geranium (Lady Washington)
92	Pelargonium x hortorum cv./(Zonal) Geranium
96	Petunia x hybrida cv./Common Garden Petunia
114	Salvia splendens cv./Salvia
120	Senecio cineraria 'Diamond'/Diamond Dusty Miller
131	Tagetes species cv./Marigold
134	Viola x wittrockiana cv./(Garden) Pansy
138	Zinnia elegans/Zinnia

List of Plants for Job 1 – by Type (continued)

Cut Flowers (choose 20)

Number	*Name*
1	Achillea millefolium/Yarrow
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16	Carthamus tinctorius/Safflower
21	Chamelaucium uncinatum/Wax Flower
25	Chrysanthemum x morifolium/Standard Daisy
30	Consolida/Larkspur
34	Delphinium elatum/Delphinium
35	Dianthus caryophyllus/Carnation (standard)
42	Erica sp./Heather
46	Eustoma grandiflorum (Lisianthus)
51	Freesia x hybrida/Freesia
54	Gerbera jamesonii/Gerbera Daisy
56	Gypsophilia elegans/Baby's Breath
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75	Limonium sinuatum/Statice
80	Matthiola incana (Stock)
82	Moluccella laevis/Bells of Ireland
89	Paeonia cv./Peony
107	Rosa sp./Standard Rose
113	Salix sp.
124	Solidago sp.
127	Stephanotis floribunda/Stephanotis
133	Tulipa cv./Tulip
136	Zantedeschia sp./Calla Lily

FLORICULTURE-GREENHOUSE – PILOT (4350) (continued)

List of Plants for Job 1 – by Type (continued)

House Plants (choose 15)

Number	Name
5	Anthurium x andraeanum cv./Anthurium, Flamingo Lily
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32	Cyclamen x persicum cv./Florist's Cyclamen
33	Cymbidium cv./Cymbidium Orchid
36	Dieffenbachia maculata cv./Spotted Dumbcane
37	Dracaena fragrans 'Massangeana'/Corn Plant Draceana
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44	Euphorbia milii splendens/Crown-of-Thorns
45	Euphorbia pulcherrima cv./Poinsettia
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48	Ficus elastica 'Decora'/'Decora' Rubber Plant
49	Ficus pumila/Creeping Rubber Plant
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53	Gardenia jasminoides 'Fortuniana'/Gardenia
55	Gynura aurantiaca 'Sarmentosa'/"Purple Passion," Velvet Plant
60	Heptapleurum arboricola/Dwarf Schefflera, Dwarf Octopus Tree
61	Hippeastrum hybrid cv./Amaryllis
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84	Monstera deliciosa/Cutleaf "Philodendron"
85	Neoregelia carolinae 'Tricolor'/Bromeliad

List of Plants for Job 1 – by Type (continued)

House Plants (continued)

Number	Name
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94	Peperomia caperata/Emerald Ripple Peperomia
95	Peperomia obtusifolia "Variegata'/Variegated Peperomia
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116	Saxifraga stolonifera/Strawberry Plant
117	Schlumbergera bridgesii/Christmas Cactus
118	Schlumbergera truncata cv./Thanksgiving Cactus, Crab Cactus
121	Senecio x hybridus cv./Florist's Cineraria
122	Sinningia speciosa Fyfiana Group cv./Gloxinia
123	Solanum pseudocapsicum cv./Jerusalem Cherry
125	Spathiphyllum clevelandii/White Anthurium, Peace Lily
129	Sterlitzia reginae/Bird-of-Paradise
130	Syngonium podophyllum/Nephthytis
132	Tolmiea menziesii/Piggyback Plant
137	Zebrina pendula cv./Wandering Jew

List of Plants for Job 1 – by Type (continued)

Cut Foliage (choose 5)

Number	Name
14	Buxus sp.
18	Cedrus sp/Cedar
43	Eucalyptus polyanthemos/Silver Dollar Eucalyptus
57	Hedera helix cv./English Ivy
103	Pinus strobes
109	Ruhohra adiantiformis/Leather Leaf Fern, Baker Fern
110	Ruscus hypoglossum/Italian Ruscus
112	Salal sp.
135	Xerophyllum sp.

JOB 2: SYMMETRICAL TRIANGLE ARRANGEMENT

(per participant)

- 9 Standard Carnations
- 5 Daisy or Cushion Poms
- 2 stems Baby's Breath
- 10 stems Leather Leaf
- Container
- Floral Foam-dry (1/3 block)
- Floral shears or floral knife
- Florist knife
- Waterproof dish tape (anchor tape)
- Sink or bowl of water to soak the foam
- Calculator
- Writing utensil (pen or pencil)

JOB 3: DESIGN A MULTI-FLOWER CORSAGE

- Several types of flowers, various colors (may be artificial)
- Florist knife
- Florist shears
- Floral tape
- Corsage ribbon in assorted colors
- Wire—assorted sizes
- Wire cutters
- Floral adhesive (pan or floral glue)
- Plastic corsage bag/box
- Corsage pin
- Small amount of foliage, tulle, or artificial leaves
- Chenille stems/pipe cleaners (white or green

NOTE: Participants may use either floral wire/tape or floral adhesive to secure flowers in Job 3.

JOB 4: CASH REGISTER/SALES

- Cash register or cash drawer with calculator
- Order pad
- Writing utensil (pen or pencil)
- Paper currency and coins (may be real or "play" money)
- Product price list (in participant's performance book)
- Individual to serve as customer (not a student)

JOB 5: IDENTIFY AND CONTROL PESTS

- Four plant and pest specimens:
  - ✓ Two examples of insect damage and two examples of plant diseases typically found in a greenhouse, from your geographical area
  - ✓ May use clear, color photographs or actual plants

- Hand lens, if using actual plants
- Reference guides for treatment methods
- Identification sheet (provided in Participant books)
- Pencils and paper

HEALTH ASSISTING – PILOT (4143)

NOTE: Sufficient volunteers should be recruited as "suspects/victims" for this assessment. NOCTI strongly recommends that **adult** volunteers serve as human subjects for this assessment. However, in the event that this is not feasible and student volunteers are used, NOCTI **requires** that the students used are **NOT** part of the program being tested or of a similar program. Teachers may **not** serve as volunteers.

JOB 1: HAND WASHING AND PERSONAL PROTECTIVE EQUIPMENT (PPE)

Hand washing

Sink with hot and cold running water
Liquid antibacterial soap
Paper towels
Waste container

Apply/Remove PPEs

Work surface (clean and flat)
Isolation gowns, assorted sizes
Clean exam gloves, assorted sizes
Surgical masks, assorted types
Waste container
Laundry container

JOB 2: CHANGE A PATIENT GOWN

Provide the following:

- Volunteer "patient" *(see NOTE above)*
- Wristband with patient name
- Permanent marker to write name on wristband
- Adjustable bed with brakes
- Bed linens, including a top sheet
- Call bell/button
- Privacy curtain or screen
- Clean fabric gowns (assorted sizes)
- Soiled linen container

Set-up:

- Set this job up where it is not visible to participants who have not performed the job
- "Patient" in bed, wearing gown and a wristband with name, exhibiting right-sided weakness *(see NOTE above)*
- Bed made with linens, including a top sheet
- Clean gowns close by in vicinity or at work area
- Soiled linen container near patient bed

JOB 3: MEASURE VITAL SIGNS, HEIGHT, AND WEIGHT

Provide the following:

- Volunteer "patient" *(see NOTE above)*
- Worksheet (provided in Participant booklets)
- Blood pressure cuff
- Stethoscope (must be teaching stethoscope)
- Balance scales with measuring staff (not digital)
- Alcohol wipes
- Watch or clock with second hand
- Scrap paper
- Writing utensils

JOB 4: TRANSFER PATIENT FROM BED TO WHEELCHAIR

Provide the following:

- Bed
- Wheelchair
- Volunteer "patient" *(see NOTE above)*
- Non-skid foot covering for patient
- Gait belt
- Call bell/button

Instructions for the "patient:"

Simulate left-sided weakness by holding left arm and left leg limp during this job, as if they are non-functioning.

HORTICULTURE-LANDSCAPING – PILOT (4150)

JOB 1: IDENTIFY AND CONTROL PESTS

- Four plants: two with examples of insect damage and two with examples of diseases
  (may use clear, color photographs or actual plants)
- Hand lens, if using actual plants
- Approved pesticide recommendations
- Production manual for horticultural crops
- Identification sheet (provided in participant book)
- Pencils

JOB 2: IDENTIFY EQUIPMENT FEATURES AND RECORD MEASUREMENTS

- One 4-cycle piece of equipment with appropriate user manual (example: 4-cycle lawn mower)
- Spark plug for 4-cycle piece of equipment that is gapped **WIDER** than manual recommendations
- Spark plug gap gauge
- One 2-cycle piece of equipment with appropriate user manual (example: 2-cycle string trimmer)
- Pencils
- Safety glasses
- 10 Tags or stickers labeled as follows:
  - 2 tags/stickers labeled #1
  - 2 tags/stickers labeled #2
  - 2 tags/stickers labeled #3
  - 2 tags/stickers labeled #4
  - 2 tags/stickers labeled #5

JOB 3: INSTALL A CONTAINER-GROWN PLANT

- Gloves
- Hose, nozzles, and water supply
- Peat moss or other organic material (bale or bag)
- Three to four 4-feet by 4-feet burlap squares **or** one 12-feet by 12-feet tarp **or** wheelbarrow
- Planting site, pre-worked
- Spades and other manual digging tools
- Selection of living, container-grown (2 to 5 gallon) plants (one per student)
- Soil knife or utility knife to make vertical cuts on root ball if needed
- Safety glasses

JOB 4: PRUNE A TREE AND AN EVERGREEN SHRUB

- Branches – both evergreen and deciduous, to demonstrate pruning practices (enough samples for all test takers)
- Tree, requiring pruning
- Evergreen shrub, requiring pruning
- Gloves
- Hand pruning shears
- Hedge shears
- Lopping shears
- Pruning saw
- Sanitizing products for equipment
- Wrapped wire twist-ons (may use flagging tape instead)
- Safety glasses

JOB 5: STAKE OUT A SITE PLAN: ENTRANCE WALKWAY

- Ball of string or twine
- Red (3), green (3), and yellow (10) color-coded stakes
- Marker paint
- Hammer or hand sledge
- Measuring tapes (2) 25 foot or larger
- Nails (to hold measuring tape in place)
- Paper and pencil
- Scissors or knife to cut twine
- Container to hold materials
- Turf or tilled area (16-feet by 30-feet)
- 2 by 4 lumber
- Lumber anchor
- Safety glasses

INDUSTRIAL ELECTRICITY – PILOT (3050)

JOB 1: TOOLS AND MATERIALS IDENTIFICATION

- Pencils or other writing utensils.
- Workbench or long shelf for displaying items.
- Provide 15 stickers or tags for numbering items.
- Provide **15 items** *of your choice* and *according to availability in your area* from the list below:

- ✓ Sta-Kon® pliers
- ✓ Pipe reamer
- ✓ Hickey
- ✓ 1/2-inch EMT bender
- ✓ Pipe threader
- ✓ Knock-out punch
- ✓ L.B. fitting
- ✓ L.R. fitting
- ✓ L.L. fitting
- ✓ T. fitting
- ✓ F.S. fitting
- ✓ 90-degree pulling elbow
- ✓ Chase nipple
- ✓ Offset nipple
- ✓ Close nipple
- ✓ Reducing washer
- ✓ Plastic bushing
- ✓ Insulating grounding bushing
- ✓ Sealight connector
- ✓ Two-screw connector
- ✓ 4 C.S. 1/2-inch handy box
- ✓ Greenfield connector
- ✓ Compression EMT connector
- ✓ Set screw EMT coupling
- ✓ Rigid coupling
- ✓ 1/2-inch KO handy box
- ✓ Oil seal
- ✓ Erickson fitting
- ✓ Kellum grip
- ✓ Snap-in blank
- ✓ One-hole strap

JOB 2: WIRING A MOTOR STARTER

NOTE: These steps MUST be accomplished PRIOR to test administration.

1. The physical layout can be done on a 4-foot by 4-foot or larger plywood board. There are no minimum or maximum distances to be set up.

2. Construct, according to local codes, the layout to be used by the participant. Refer to the diagrams on the following page and install the following:

   - Disconnect
   - Transformer enclosure and transformer
   - Motor starter and enclosure
   - Start/stop station
   - Motor

3. Suggested equipment and materials to be provided for this job are:

   - 480V or 208V, 30a, 3 Ø disconnect, fusible (any brand)
   - 1/2-inch EMT conduit
   - 14-inch by 12-inch junction box (or equivalent)
   - 50 VA control transformer, dual or single voltage, 480V or 208V/120V (with control fuse)
   - Allen Bradley starter, size 00 with 120V coil (or equivalent)
   - Miscellaneous fittings
   - Start/stop station with pilot light (any brand)
   - Wire numbers
   - 9-lead, 3 Ø motor, 480/240 fractional hp (any brand)
   - #12 wire (black, red, white, green)
   - Assorted sizes of wire (to provide selection opportunity for participants)
   - Wire connectors, assorted types (Sta-Kon®, wire nuts, tape, etc.)
   - Fuses, both line and control: 15-20-30a
   - 1/2-inch Liquitite® flexible conduit
   - Miscellaneous hand tools, as required (your choice)
   - Overload heaters of proper size for the motor

NOTE: Equipment and materials listed for Job 2 are **suggestions only.** You may make any reasonable substitutions, as necessary.

JOB 2: WIRING A MOTOR STARTER (continued)

Physical Layout

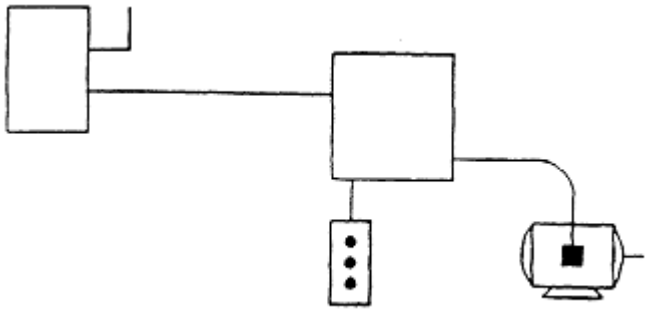
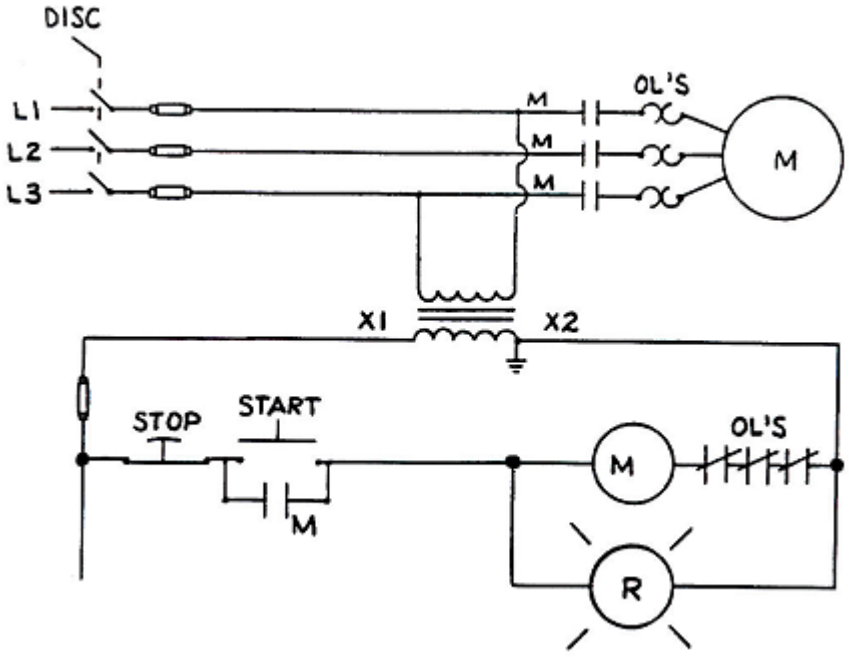


Diagram for Job 2



JOB 3: BENDING ELECTRICAL METALLIC TUBING (EMT)

- 10-foot piece of 1/2-inch EMT (per participant)
- 1/2-inch EMT bender or 1/2-inch Chicago bender
- Torpedo level
- Small conduit vise
- Hacksaw
- Lineman's pliers
- Tape measure
- Pencil

JOB 4: REPLACING BALLASTS ON A FLUORESCENT FIXTURE

- 4-foot, 4 lamp, 120V fluorescent fixture
- AC line cord
- 2 electronic ballasts for fixture (with screws and ground screw)
- 4 good lamps for fixture
- Assorted wire nuts
- 2-screw connector

NOTE: Fixture may be set on a workbench or mounted, with access to an electrical outlet. If fixture is suspended from the ceiling, a ladder should be provided, if appropriate.

INDUSTRIAL MAINTENANCE MECHANICS – PILOT (3074)

JOB 1: CONNECT AND OPERATE A CIRCUIT

- All necessary protective clothing and safety equipment
- Air pressure source for pneumatic
- Electric supply source 24 VDC regulated power source (minimum 5 amps DC supply)
- 1 – push button switch
- 1 – double-acting single throw selector switch (toggle switch) with a “bat” handle
- 2 – metal mounting boxes for above switches
- 2 – limit switches
- 3/8-inch air line, 8 feet
- 1 – 24 VDC control relay with 2 N.O. contacts
- Green and red indicator lamps (24 VDC) with holders (sockets) with screw terminals
- Phillips screwdriver
- Flat head screwdriver
- Utility knife
- 10 – 3/8-inch air line hose clamps
- 2 – flow control valves (full-flow one-way)
- 10 – 3/8-inch threaded barbed hose fittings
- 1 – double-acting pneumatic cylinder (1 inch by 6 inch) with 3/8-inch threaded ports
- 2/4 directional control valve (DCV) with one solenoid with 24-volt DC coil
- 20 feet – blue 16-gauge multi-strand wire (THHN) (+DC)
- 20 feet – white with blue stripe 16-gauge multi-strand wire (THHN) (-DC)
- 2 – wire nuts appropriate for 16-gauge wire
- Plywood sheet (2 feet by 2 feet)
- 30 – #8 wood screws (1/2 inch long)
- Non-programmable calculator
- Clock or timer

JOB 2: ASSEMBLE A MULTIPLE SHAFT GEAR DRIVE SYSTEM

- All necessary protective clothing and safety equipment
- Lock-out/tag-out device
- Workbench (or adequately sized workstation)
- 1/2 horsepower variable speed electric motor, 110 volts
- Flexible coupling appropriate size for motor and shaft
- Clamp-on ammeter
- 8 – pillow block bearings, 5/8-inch
- Aluminum spacers
- 2 – shafts, cold rolled, 5/8 inch diameter by 12 inch length (keyed for .185 key stock)
- 2 – shafts, cold rolled, 5/8 inch diameter by 8 inch length (keyed for .185 key stock)
- 2 – spur gears, 12 diametrial pitch (DP) with 36 teeth
- 1 – spur gear, 12 diametrial pitch (DP) with 48 teeth
- 1 – spur gear, 12 diametrial pitch (DP) with 24 teeth
- Key stock, 2 feet, .185 inch
- 1 – prony brake
- Bed plate (3 feet by 4 feet by 1/4 inch) – aluminum plate (slotted to 3/8 inch per print)
- 10 nuts and bolts – 5/16 inch – 18 UNC–2A by 2-1/2 inch
- 20 nuts and bolts – 5/16 inch – 18 UNC-2A by 4-1/2 inch
- 60 flat washers – 5/16 inch
- 30 lock washers – 5/16 inch
- 2 – wrenches – 1/2 inch
- Hex key, standard set
- Socket set, 3/8-inch drive
- 1 rubber mallet
- Punch #3
- 1 – ballpeen hammer – 22 ounce
- 1 – dial indicator with magnetic base
- Power source, 110 volt
- Feeler gauge set
- 10 – shims, sheet metal (.005)
- 10 – shims, sheet metal (.010)
- Straight edge rule, 24 inch
- Grease gun – filled
- Level, 3 inch
- Pencils/paper
- Non-programmable calculator
- Clock or timer

JOB 3: READ AND INTERPRET AN INDUSTRIAL BLUEPRINT

- Pencils
- Blueprint and worksheet (provided in Performance Assessment booklet)
- Clock or timer

JOB 4: TROUBLESHOOT AN ELECTRICAL CONTROL SYSTEM

- All necessary protective clothing and safety equipment
- Grounded workbench (or adequately sized workstation)
- Rubber mat to stand on
- Electric motor, 3-phase Y-connected (with a blown fuse from Line 1 to H1 on transformer)
- Multimeter
- Fuse (working) appropriate size for motor
- Switch (working) appropriate size for motor
- Starter relay (working) 3-phase, appropriate size for motor
- Phillips screwdriver
- Flat head screwdriver
- Fuse pullers (appropriate sizes for each size fuse)
- Non-programmable calculator
- Clock or timer

MANUFACTURING TECHNOLOGY – PILOT (3084)

JOB 1: MILLING OPERATIONS

- All necessary protective clothing and safety equipment
- 1/2-inch by 2-inch by 3-inch low-carbon steel (cut from 1/2-inch by 2-inch flat stock)
- Steel rule
- 0 to 1-inch depth micrometer
- 0 to 1-inch outside micrometer
- 1 to 2-inch outside micrometer
- Vernier, dial, or digital caliper
- Center punch
- Fractional drill index set
- 1/2-13 UNC/2B hand tap set
- Tapping guide
- Tap handle
- Countersink (3/4 inch), any angle
- Precision square
- 1/2-inch end mill
- Bevel protractor
- Parallels
- Dial indicator and attachments
- Height gauge
- Layout dye
- Scriber
- Vertical milling machine
- Adequate accessories (collets, chucks, swivel, or universal vise)
- Selection of end mills, including one 3/8-inch and one under 3/8-inch
- Mill file
- Deburring tool
- Cutting fluids
- Appropriate wrenches
- Edge finder
- Machinery's Handbook (current) or abbreviated version
- Non-programmable calculator
- Pencils/paper
- Surface plate
- Clock or timer

MANUFACTURING TECHNOLOGY – PILOT (3084) (continued)

JOB 2: ASSEMBLE A MULTIPLE SHAFT GEAR DRIVE SYSTEM

- All necessary protective clothing and safety equipment
- Lockout/tagout device
- Workbench (or adequately sized workstation)
- 1/2-horsepower variable speed electric motor, 110 volts
- Flexible coupling appropriate size for motor and shaft
- Clamp-on ammeter
- 8 – Pillow block bearings, 5/8-inch
- Aluminum spacers
- 2 – shafts, cold rolled, 5/8-inch diameter by 12-inch length (keyed for .185 key stock)
- 2 – shafts, cold rolled, 5/8-inch diameter by 8-inch length (keyed for .185 key stock)
- 2 – spur gears, 12 diametrical pitch (DP) with 36 teeth
- 1 – spur gear, 12 diametrical pitch (DP) with 48 teeth
- 1 – spur gear, 12 diametrical pitch (DP) with 24 teeth
- Key stock, 2 feet, .185 inch
- 1 – prony brake
- Bed plate (3 feet by 4 feet by 1/4-inch) – aluminum plate (slotted to 3/8-inch per print)
- 10 nuts and bolts – 5/16-inch – 18 UNC–2A by 2 1/2-inch
- 20 nuts and bolts – 5/16-inch – 18 UNC-2A by 4 1/2-inch
- 60 flat washers – 5/16-inch
- 30 lock washers – 5/16-inch
- 2 – wrenches – 1/2-inch
- Hex key, standard set
- Socket set, 3/8 inch drive
- 1 rubber mallet
- Punch #3
- 1 – ball peen hammer – 22 ounce
- 1 – dial indicator with magnetic base
- Power source, 110 volt
- Feeler gauge set
- 10 – shims, sheet metal (0.005)
- 10 – shims, sheet metal (0.010)
- Straight edge rule, 24-inch
- Grease gun – filled
- Level, 3-inch
- Pencils/paper
- Non-programmable calculator
- Clock or timer

JOB 3: DETERMINING GAUGE BLOCK COMBINATIONS

- One complete set of standard 81-piece gauge Blocks
- Height gauge
- Granite surface plate
- Machinery's Handbook (current) or abbreviated version
- Pencils/paper
- Non-programmable calculator
- Clock or timer
- Lint free cloth

MEDICAL CODING/HEALTH INFORMATION – PILOT (1042)

JOB 1: VERIFY PATIENT INSURANCE INFORMATION

- Person(s) to act as insurance company representatives (See NOTE below)
- Pens or pencils

NOTE: It is recommended that multiple people act as "Insurance Contacts", as available, allowing multiple participants to perform Job 1 at the same time.

JOB 2: CODE FOR BILLING FROM A DISCHARGE SUMMARY

- ICD-10-CM codebook
- Current CPT codebook
- CMS sheets, blank (1 per participant)
- Pens or pencils

JOB 3: CODE FROM MULTIPLE PROCEDURAL REPORTS

- ICD-10-CM codebook
- Current CPT codebook
- Current ICD-10-PCS
- Pens or pencils

PRACTICAL NURSING – PILOT (4162)

NOTE: Sufficient volunteers should be recruited as "suspects/victims" for this assessment. NOCTI strongly recommends that **adult** volunteers serve as human subjects for this assessment. However, in the event that this is not feasible and student volunteers are used, NOCTI **requires** that the students used are **NOT** part of the program being tested or of a similar program. Teachers may **not** serve as volunteers.

PROCEDURE 1: TAKE VITAL SIGNS

- Thermometer (type used in your area)
- Sphygmomanometer
- Stethoscope – Dual/Teaching
- Watch with second hand
- Alcohol swab
- Individual to act as patient *(see NOTE above)*
- Name band
- Patient chart
- Pen

PROCEDURE 2: TRANSFER A CVA PATIENT

- Bed
- Wheelchair
- Transfer belt
- Name band
- Robe and non-skid footwear
- Blanket
- Individual to act as CVA patient *(see NOTE above)*

PROCEDURE 3: INSERTION OF INDWELLING CATHETER

- Wash cloth
- Towel
- Soap
- Basin of water
- Mannequin to serve as patient *(see NOTE above)*
- Betadine swabs
- Sterile, disposable catheter kit/tray
- Non-sterile gloves
- Sterile gloves (if not in kit)
- Sterile drapes (if not in kit)
- Syringe prefilled with normal saline (if not in kit)
- Appropriate size catheter (if not in kit)
- Drainage tubing and collection bag (if not in kit)
- Lubricant (if not in kit)
- Catheter anchor device
- Light source
- Name band
- Sheet or blanket
- Second person, if necessary
- Patient chart
- Pen

PROCEDURE 4: REMOVE CONTAMINATED LINEN FROM ISOLATION UNIT

- Gown
- Mask
- Gloves
- Chair
- Contaminated bed linen
- Linen bags
- Receptacle for dirty gown, mask, and gloves
- Second health care worker outside of isolation unit
- Biohazard labels if appropriate

PROCEDURE 5: ADMINISTRATION OF MEDICATION

- Medications, unit dose, or multiple dose, in properly labeled bottles (may be simulated with candies)
- Medication Administration Record (MAR)
- Med cups
- Stethoscope
- Cup and water
- Individual to act as patient *(see NOTE above)*
- Medication solutions to be used for injections (appropriate to the situation)
  - Syringes with needles (appropriate to the injection sites)
  - Alcohol swabs
  - Gauze
  - Band-Aid
  - Name band
  - Patient chart with med sheet
  - Pen
  - Physician's desk reference (or drug manual)

PROCEDURE 6: DEMONSTRATE HANDWASHING, APPLICATION, AND REMOVAL OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

- Gown
- Mask
- Gloves
- Biohazard bags
- Soiled linen container
- Waste container
- Plastic liner for waste container
- Paper towels
- Hand soap
- Sink

NOTE: Participant should leave the bag in the room for Procedure 6.

Suggestions for Test Administration

1. If the nursing laboratory is not being used, the test area should be arranged in sections: dirty utility room, clean utility room, medication area, charting area and at least six testing areas (one for each procedure). All equipment should be readily available. Dividers should separate work areas.

2. There should be at least six evaluators. If duplicate stations are used, each evaluator may be assigned to two participants simultaneously.

3. Since the performance test procedures are independent of each other, a rotation plan may be used, assigning the procedures in any order that best fits the available facilities.

Sample Rotation Plan

Participant Number	8:00-8:15	8:15-8:30	8:30-8:45	8:45-9:00	9:00-9:15	9:15-9:30	9:30-9:45	9:45-10:00	10:00-10:15	10:15-10:30	10:30-10:45	10:45-11:00
1	M-Res	M-Adm	M-Adm	M-Cal	M-Cal Rest	VS	CVA	CVA	IL	IL	CATH	CATH
2	CVA	CVA	M-Res	M-Adm	M-Adm	M-Cal	M-Cal Rest	VS	CATH	CATH	IL	IL
3	IL	IL	CATH	CATH	M-Res	M-Adm	M-Adm	M-Cal	M-Cal Rest	VS	CVA	CVA
4	CATH	CATH	IL	CVA	CVA	M-Res	M-Adm	M-Adm	M-Adm	M-Cal	M-Cal Rest	VS
5	**	VS	CVA	CVA	IL	IL	CATH	CATH	M-Res	M-Adm	M-Adm	M-Cal

KEY

VS:	Vital Signs
CVA:	Patient Transfer
CATH:	Catheter Insertion
IL:	Isolation Linen
M-Res:	Research Medication
M-Adm:	Administer Medication
M-Cal:	Medication Calculation
Rest:	Let patient rest
**:	Participant starts at 8:15 a.m.

STATIONS and PARTICIPANTS

5 Participants
1 Station for Each Procedure = 6

PRECISION MACHINING – PILOT (4152)

JOB 1: MILLING OPERATIONS

- Vertical milling machine
- Drill chuck
- R-8 collet – appropriate sizes
- 1/2 inch by 2 inches by 3 inches low carbon cold rolled steel (such as 1018/1020) (cut from 1/2 inch by 2 inch flat stock)
- Steel rule
- 0 to 1-inch depth micrometers
- 2 to 3-inch outside micrometers
- Vernier, dial, or digital calipers
- Parallels
- Dead Blow Hammer
- Dial indicator and attachments
- Abrasive shop cloth/emery cloth
- Adequate accessories (collets, chucks, swivel, or universal vise)
- Mill file
- Deburring tool
- Cutting fluids
- Cutting tools:
  - #3 or #4 Center Drill
  - Drill – 23/64 inch
  - Reamer – .375 inch
  - Endmill - 5/8 inch diameter **or** Counterbore 5/8 inch diameter with 3/8 inch diameter pilot
  - Endmill – 3/8 inch diameter
  - Endmill – 5/16 inch diameter
- Appropriate wrenches
- Edge finder
- *Machinery's Handbook*, or abbreviated version
- Nonprogrammable calculator
- Pencils/paper
- Surface plate
- Clean shop rags

JOB 2: LATHE OPERATIONS

- Low carbon cold rolled steel (such as 1018/1020), 1.00 inch diameter by 4.00 inches (stock is to be pre-sawed, leaving enough material to face one end)
- Steel rule
- 0 to 1-inch outside micrometers
- 1 to 2-inch outside micrometers
- Vernier, dial, or digital calipers
- Protractor with blade (from combination set)
- Layout dye
- Test nut or .750-16 UNF 2A Go/No-go ring gage
- Engine lathe with live centers, aligned tailstock, and thread chasing dial
- Three-jaw chuck or collet appropriate to hold 1.00 inch diameter
- Drill chuck, key, and sleeve for tailstock mounting
- Dial indicator with stand
- V-Block
- Center drill (#3)
- Standard tool holders
- Tool bits for straight turning, shoulder turning, and facing (HSS)
- Thread cutting tool holder and 60-degree thread tool (HSS)
- 1/8-inch cut-off tool and holder
- Thread center gage (fishtail)
- Threading compound
- Screw pitch gage
- Mill file
- Cutting fluid
- Appropriate wrenches (compound, Allen, Tool Post)
- *Machinery's Handbook*, or abbreviated version
- Nonprogrammable calculator
- Pencils and paper
- Surface plate
- Abrasive shop cloth/Emery cloth
- Clean shop rags

PRE-ENGINEERING/ENGINEERING TECHNOLOGY – PILOT (3475)

JOB 1: BUILD A SIMPLE CIRCUIT

- Breadboard
- Solid core wire, (#20-22 AWG) 6-8 feet per participant
- Multimeter
- Wire strippers
- Wire cutters
- Potentiometer (5 kΩ)
- Test leads, one pair
- 9-volt power source
- 5 different resistors with a variety of values
- SPST switch – one per participant
- Lamp – 1.5 volt flashlight lamp
- Lamp holder to accommodate lamp
- Schematic diagram *(supplied in participant's booklet)*
- Paper
- Pencil

JOB 2: PREPARE A TECHNICAL REPORT

- Computer with word processing software
- Graph paper
- Printer
- Pencil

JOB 3: PREPARE A PRESENTATION

- Computer with graphics and presentation software (i.e., PowerPoint)
- Appropriate power supply and cables
- Printer

PRODUCTION AGRICULTURE – PILOT (3163)

JOB 1: VEHICLE MAINTENANCE

- Vehicle with *non-diesel* engine (your choice) with **Make** and **Model Number** visible

  Prior to test: *Deflate some air from the right front tire*
  Adjust engine oil so it will read low
  Establish coolant level for a cool engine reading
  Insert information in the **Evaluator Answer Key** *below*

- Tire pressure gauge
- Waste rags or cloths
- Pencils

JOB 1 – Evaluator Answer Key

VEHICLE MAINTENANCE WORKSHEET

Vehicle Make _____ Model _____

Is oil needed? ____ yes ____ no

Fuel Gauge Reading:
_____

Recommended Tire Inflation: _____ psi Front Right Tire Inflation: _____ psi

Is engine coolant needed? _____yes _____no

JOB 2: CALCULATE NET WORTH

- Pencil
- Scrap paper
- Non-programmable calculator

JOB 3: DETERMINE GENOTYPES AND PHENOTYPES

- Pencil
- Scrap paper

JOB 4: SOIL TEST INTERPRETATION

- Pencil
- Scrap paper
- Non programmable calculator

JOB 5: ADMINISTER AN INJECTION

- Medicine bottle filled with injectable saline (or other liquid)
- 3 syringes (3cc, 6cc, 12cc)
- 3 needles of three different sizes:
  - 18 gauge 1-inch (pea green cover)
  - 20 gauge 1-1/2 inch (pink cover)
  - 1/2-inch long needle of any gauge
- Sharps container
- Alcohol swabs
- Injection "subject" (See **Note** below)
- Pencil
- Scrap paper
- Non-programmable calculator

Note: The use of live animals as injection subjects is NOT encouraged! We recommend using a stuffed animal (cow or steer), but an orange or other appropriate "subject" may be used.

PROTECTIVE SERVICES – PILOT (3480)

NOTE: Sufficient volunteers should be recruited as "suspects/victims" for this assessment. NOCTI strongly recommends that **adult** volunteers serve as human subjects for this assessment. However, in the event that this is not feasible and student volunteers are used, NOCTI **requires** that the students used are **NOT** part of the program being tested or of a similar program. Teachers may **not** serve as volunteers.

JOB 1: STREET INTERVIEW

- Volunteer(s) to act as the suspect, clothed in baseball hat, shirt, pants with pockets, and shoes and cuffed socks (See NOTE above)
- Form of ID (driver's license or other government-issued ID)
- Powdered sugar or flour in a small plastic bag (pretend cocaine)
- Oregano in a small plastic bag (pretend marijuana)

JOB 2: ARREST AND SEARCH

- Volunteer(s) to act as the suspect (See NOTE above)
- Exam gloves
- Form of ID (driver's license or other government-issued ID)
- Powdered sugar or flour in a small plastic bag (pretend cocaine)
- Oregano in a small plastic bag (pretend marijuana)
- Handcuffs
- Handcuff key(s)
- Small paper bags (i.e., lunch bags) to hold evidence
- Marker or pen

JOB 3: COMPLETE AN INCIDENT REPORT

- Pencil or pen

JOB 4: CHEMICAL IDENTIFICATION

- Emergency Response Guidebook, published by the U.S. Department of Transportation (most current copy available)
- Pencil or pen

JOB 5: FIRE SUPPRESSION DEMONSTRATION

(Evaluators can either ask participants to physically put on "turn-out" gear **or** record what "turn-out" gear would be appropriate to wear, depending on the resources available at their site).

- Adult volunteer to act as victim or an adult-sized mannequin
- Turn-out gear (as available – see note above)
- Fire hose (100 feet of 1-1/2-inch hose)
- Nozzle (1-1/2-inch fog nozzle)
- Water source (if desired or available)

PROTECTIVE SERVICES – PILOT (3480) (continued)

JOB 6: PATIENT ASSESSMENT

- Volunteer(s) not in the program, to act as the patient (See NOTE on previous page)
- Exam gloves
- Blood pressure cuff
- Stethoscope
- Watch with a second hand
- Pencil or pen

JOB 7: PERFORM CPR ON AN ADULT

NOTE: Participants may perform CPR using either American Heart Association or American Red Cross method, depending on what the participant has been taught.

- Adult size CPR mannequin
- Pocket mask for CPR
- AED Trainer
- Exam gloves

SMALL ANIMAL SCIENCE AND TECHNOLOGY – PILOT (3103)

A timer will be required for all jobs.

JOB 1: IDENTIFY TOOLS AND EQUIPMENT

- Pencils
- Scratch paper
- Numbered tags or stickers (1-15)
    - Bandage scissors
    - E-Collar (Elizabethan)
    - Fecal loop
    - Gavage needle
    - Hemostatic forceps
    - Muzzle
    - Ophthalmoscope
    - Otoscope
    - Periodontal probe
    - Plier nail clippers (Bypass clippers)
    - Scissor nail clipper
    - Slicker brush
    - Thinning shears
    - Thumb forceps
    - Towel clamp

JOB 2: PROPER RESTRAINT AND SEX DETERMINATION OF SMALL ANIMALS

Select 3 types of small animals from the following list:

Each selected animal must be in an appropriate cage.

- Ferret (must have current rabies vaccination certificate)
- Gerbil
- Guinea Pig
- Hamster
- Mouse
- Rabbit
- Rat

JOB 3: IDENTIFY PARASITES

- Pencils
- Scratch paper
- Microscope stations (four)*
- Paper or stickers to cover the microscope identification labels.

Prepare slides (or purchase prepared slides) for:

- Hookworm
- Roundworm
- Tapeworm
- Whipworm

*If you do not have four microscopes, set up stations according to the number of microscopes available.

JOB 4: FILL SYRINGES

- One bottle of injectable liquid (medication)
- Sharps container

Syringes:

- one 1 cc (tuberculin) syringe
- one 3 cc syringe
- one 6 cc syringe

Needles:

- one 18 gauge needle
- one 22 gauge needle
- one 25 gauge needle

JOB 5: CANINES: SAFETY, HANDLING, RESTRAINT, AND EXTERNAL ANATOMY IDENTIFICATION

- 2 to 4 dogs (20 to 40 lbs each) - must have current rabies vaccination certificate
- Clock with second hand
- Table (suitable for dogs)

JOB 6: DETERMINE PROPER DIET FOR ANIMALS

- Pencils
- Scratch paper

SMALL ENGINE TECHNOLOGY – PILOT (4168)

JOB 1: START AND ADJUST ENGINE

- Four-stroke cycle engine securely mounted to a workbench, engine stand or power mechanism
- Service manual
- Workstation
- Tools and testing equipment (see General Tools and Equipment List)

JOB 2: IGNITION SERVICE

- Four-stroke cycle engine, with a solid state ignition system, securely mounted to a workbench or engine stand
- Service manual
- Tools and equipment (see General Tools and Equipment List)
- Broken (sheared) flywheel key

JOB 3: MEASURE PARTS

- Disassembled engine providing access to the piston, piston rings, crankshaft and cylinder
- Service manual
- Tools and testing/measuring equipment (see General Tools and Equipment List)
- Workbench
- Pencils

JOB 4: VALVE SERVICE

- Four-stroke cycle engine with necessary parts removed to gain access to the valve train
- Service manual
- Tools and measuring equipment (see General Tools and Equipment List)
- Workstation
- Gaskets

JOB 5: CARBURETOR SERVICE

- Float-type carburetor with service manual
- Diaphragm carburetor with service manual
- Tools and equipment (see General Tools and Equipment List)

JOB 6: INVOICING PARTS

- Four engine parts to be invoiced by participants
- Resources for part look-up, manual or electronic, as available
- Computers, if needed
- Pencils and calculator

JOB 7: MANUAL STARTER SERVICE

- Manual type starter assembly that has been removed from the engine
- Starter rope
- Starter pawl(s)
- Starter spring/pulley
- Starter cup
- Pencils

GENERAL TOOLS AND EQUIPMENT LIST

- 0- to 1-inch micrometer
- 1- to 2-inch micrometer
- 2- to 3-inch micrometer
- Dial caliper
- Telescoping gauge, 2-1/8 to 3-9/16 inches
- Multimeter
- Timing equipment
- Tachometer
- Feeler gauge, flat and wire
- Small bore guage
- Non-magnetic feeler gauge
- Spark tester (appropriate type for each manufacturer)
- Starter clutch wrench (if needed)
- Flywheel holder and puller
- Screwdrivers – flat and Phillips
- 1/4-inch and 3/8-inch drive socket set – standard through 1 inch
- 1/4-inch and 3/8-inch drive socket set – Metric through 19 mm
- Spark plug wrench, 13/16 inch, 3/4 inch, and 5/8 inch
- Standard wrenches through 1 inch
- Metric wrenches through 19 mm
- Four-piece basic pliers set:
  Needlenose
  Slip joint
  Diagonal
  Lineman/Electrical
- Mechanic's wire
- Torque wrench, inch-pound and foot-pound
- Torx drivers®
- Valve spring compressor and valve removal tools
- Compression tester/leak-down tester
- 6-inch mechanic's scale – with 64ths
- Gaskets and/or appropriate sealant
- Spark plugs
- Gasoline
- Oil
- Grease
- Shop rags

TECHNICAL DRAFTING – PILOT (4154)

MANUAL

- Drawing paper
- Isometric grid paper
- Orthographic grid paper
- Scratch paper
- 30° - 60° triangle
- 45° - 90° triangle
- Brush
- Calculator
- Circle template
- Compass
- Drafting machine or parallel bar
- Drafting tape
- Eraser
- Erasing shield
- Machinery's Handbook (or equal)
- Pencils: 4H, 2H, H, and HB
- Scale
- Workstation

CAD

- CAD software and documentation
- Compatible printer/plotter with paper
- Isometric grid paper
- Orthographic grid paper
- Scratch paper
- Storage device (CDs or flash drive) if applicable
- Machinery's Handbook (or equal)
- CAD workstation

VISUAL COMMUNICATION AND INTERACTIVE MEDIA DESIGN – PILOT (3425)

JOB 1: CREATE A LOGO

Provide the following:

- Computer
- Color printer
- Vector software drawing program
- Printer paper (8-1/2 by 11 inches)
- Layout paper (for thumbnails and roughs)
- Ruler
- Pencils
- Erasers
- Colored pencils and/or colored markers
- Masking tape
- PMS (Pantone Matching System) guide for color swatch (manual or computerized)
- Font reference list/book (if available)

JOB 2: CREATE A STATIC WEB PAGE

Provide the following:

- Computer
- Web browser
- Graphic software program (must be able to optimize images for the Web)
- Layout paper
- Pencils
- Erasers

JOB 3: CREATE A BUSINESS CARD

Provide the following:

- Computer
- Printer
- Printer paper
- Page layout program
- Layout paper
- Pencils
- Erasers

WEB DESIGN – PILOT (3750)

Setup Instructions

The testing materials shipment will include a CD containing a folder called "NOCTI Web Design Performance" which holds the documents and graphics needed to complete the performance jobs. **Prior to testing, the site coordinator will give the CD NOT to the instructor or the evaluator, but to the technology staff**. The technology staff may then choose to upload the materials to the participant's individual server or upload the materials onto each participant's computer desktop on test day.

The CD contains:

- Five website text documents
- Web Design Graphics folder containing seven graphics

All folders and files must be removed from the participant's server or computer workstation at the completion of testing.

List of Equipment, Materials, and Supplies Required

- A computer workstation with Internet access for each participant
- CSS usable file, available for all participants*
- Web editing software
- Web browser software
- Word processing software that will open Microsoft Word® documents
- Image-editing software compatible with .jpg, .png, or .gif files
- Pencils
- Scratch paper
- Non-programmable calculator

*Provide all participants with a usable CSS file for Job 2. Evaluate the participant accordingly for Job 1.

NOTE: Participants may return to the CSS file and make adjustments as needed throughout the entire performance assessment, **within specified time constraints per job**.